

## **DETAILED ACTION**

### ***Current Status***

1. This action is responsive to Applicants' amendment of 19 October 2007.
2. Receipt and entry of Applicants' amendment is acknowledged.
3. Claims 1-12 and 14-23 are under active consideration in the instant application.

The 112, 103 and 102 rejections in the previous Office Action are withdrawn in favor of this Office Action.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-12 and 22 are indefinite because the claim recites a "method of preparing silica sol comprising reacting a fresh sol". The claim is confusing because the difference between "silica sol" and a "fresh sol" is not clear. Structural clarification of "silica sol" and a "fresh sol" are required for the Examiner to properly prosecute this application.

Claim 4 is indefinite because the claim recites a "reaction temperature". It is not clear what temperature Applicants are claiming. Clarification is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yates, {US 3,630,954} in view of Andersson et al., {US 5,603,805}.

Applicants claim a process for the preparation of a silica sol comprising reacting a fresh sol with guanidine carbonate in the presence of a base (sodium water glass, potassium water glass, potassium hydroxide, sodium hydroxide and combinations thereof) at a reaction temperature and at a pH of from 8 to 12, the pH being measured at the reaction temperature; wherein all the variables are as defined in the claims

***Determination of the scope and content of the prior art (M.P.E.P. §2141.01)***

Yates teaches a process for preparing silica sol comprising reacting a fresh sol with guanidine compound in the presence of a base at a reaction temperature not more

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than 70°C and at a pH of from 10.5 to 12; wherein all the variables are as defined in the specification. See columns 1-2 and Example 8.

**Ascertainment of the difference between the prior art and the claims (M.P.E.P.. §2141.02)**

Yates process of preparation of silica sol by reacting guanidine compound with a sol in the presence of a base differs from the instantly claimed process in that Yates teach a process that employed calcium hydroxide while Applicants claim a process that employs sodium water glass, potassium water glass, potassium hydroxide, sodium hydroxide and combinations.

However, the secondary reference of Andersson et al. teach a process for preparing silica sol in the presence of a base comprising alkali water glass, sodium water glass and potassium water glass. See column 2, lines 9-67.

**Finding of prima facie obviousness--rational and motivation (M.P.E.P.. §2142-2143)**

The instantly claimed process of preparation of silica sol by reacting guanidine compound with a sol in the presence of a base would have been suggested to one of ordinary skill because one of ordinary skill wishing to obtain silica sol is taught to employ the processes of Yates and Andersson et al.

One of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by varying the process conditions (batch/continuous, concentration of the base, reactants, temperature and pressure) from the teachings of Yates and Andersson et al. to arrive at the instantly claimed method for making silica sol

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by reacting guanidine compound with a sol in the presence of a base. Said person would have been motivated to practice the teaching of the references cited because they demonstrate that silica sol are useful industrial raw materials, especially in paper industry. The Examiner notes that variation the reaction conditions, for example, batch/continuous, concentration of the reactants, catalyst, temperature and pressure in a chemical reaction is a well-known chemical practice to optimize the process efficiency of the system and does not constitute a patentable distinction. Additionally, simply reversing the order of steps in a multi-step process is not a patentable modification absent unexpected or unobvious results. Ex parte Rubin, 128 U.S.P.Q. 440 (P.O.B.A 1959).

Moreover, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. The instantly claimed invention would therefore have been obvious to one of ordinary skill in the art.

### ***Allowed Claims***

Claims 14-21 and 23 are allowable over the prior art of record.

### ***Reason For Allowance***

The following is an examiner's statement of reasons for allowance: A search of the prior art failed to uncover any reference that anticipates or renders obvious a silica sol having a BET surface area of from 100 to 1200 m<sup>2</sup>/g, wherein said silica sol

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comprises from **0.05 to 15% by weight of guanidinium ions**, based on the total weight of the silica sol, wherein said silica sol is free of amine as claimed by applicants.

The closest prior art is US 3,630,954. US 3,630,954 teaches a solution of amorphous guanidine silicate containing 20% SiO<sub>2</sub> and having a mole ratio of SiO<sub>2</sub> to guanidine of 1:1. Additionally, US 3,630,954 teaches an aqueous silica sol having a surface area of from 950 m<sup>2</sup>/g to 1,800 m<sup>2</sup>/g, pH in the range of from 10.5 to 12.0, from 10% to 30% by weight of SiO<sub>2</sub> and the sol being stabilized with an amine. On the other claim a silica sol comprises from a BET surface area of from 100 to 1200 m<sup>2</sup>/g and **0.05 to 15% by weight of guanidinium ions**. These differences are not readily apparent and would not have been suggested to one of ordinary skill.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chukwuma O. Nwaonicha whose telephone number is 571-272-2908. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne (Bonnie) Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Chukwuma O. Nwaonicha/  
Examiner, Art Unit 1621

/Jafar Parsa/  
Primary Examiner, Art Unit 1621